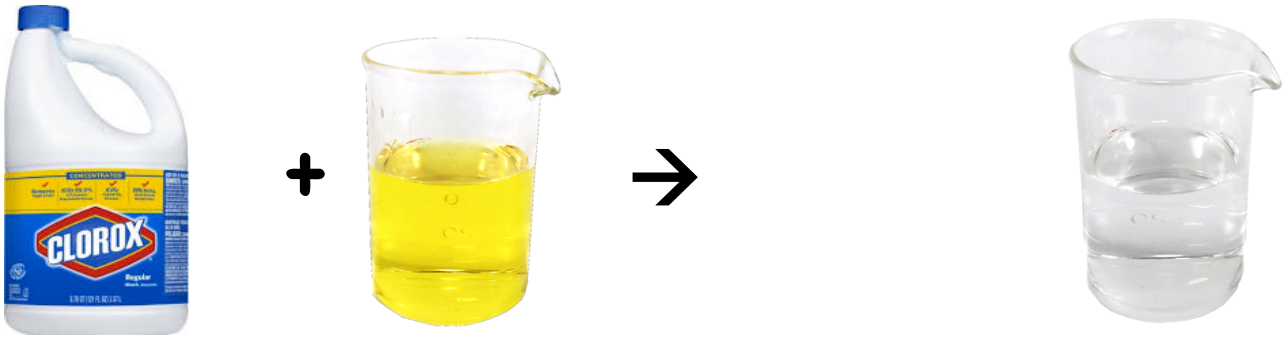
Bleaching reaction

During the bleaching reaction, the colored dye (Yellow #5) is oxidized by the active ingredient in bleach (hypochlorite or OCl^-), which results in a colorless end product. The reaction equation can be summarized as:

$$OCl^-_{(aq)} + dye_{(aq)} \rightarrow Cl^-_{(aq)} + dye\text{-}O_{(aq)}$$



SCIENCE BUDDIES

Materials you need

- 500 mL measuring cylinder
- Dye (Yellow #5)
- Water
- 200 mL beaker or plastic cup
- Bleach solution (pre-prepared)
- 3 mL pipette
- Thermometer for liquids
- Stopwatch
- 50 mL beaker or 2 oz mini cup

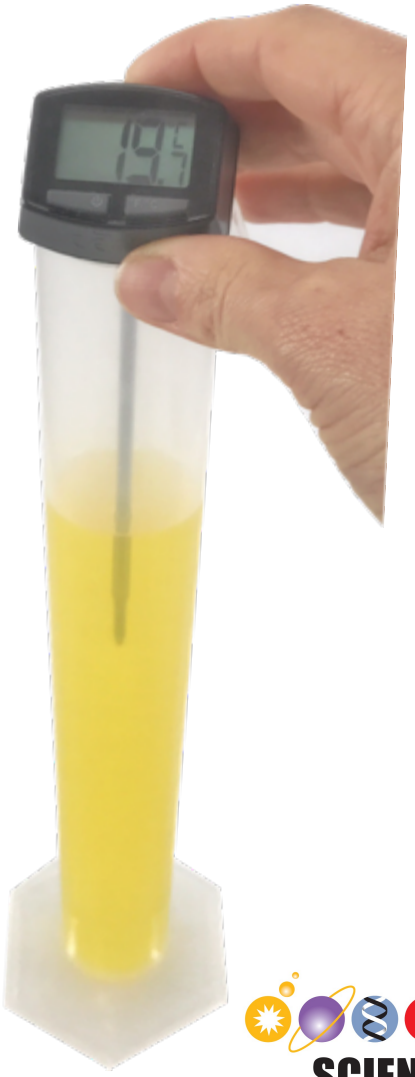


SCIENCE BUDDIES

Prepare the dye solution

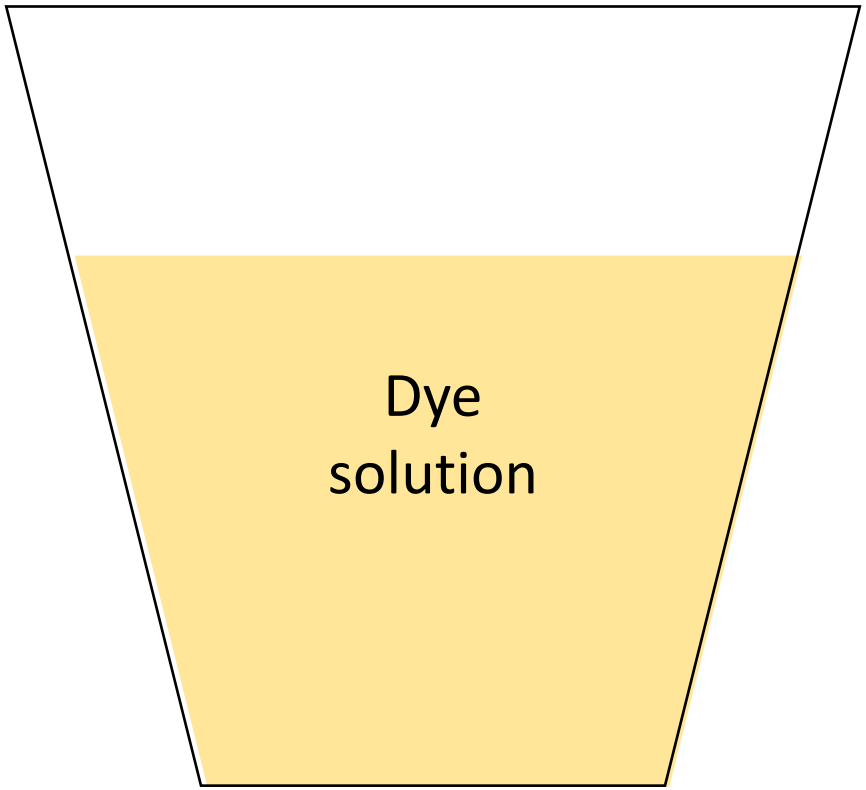


- Fill the measuring cylinder with 500 mL water (hot, cold or room temperature)
- Add 8 drops of yellow food color
- Mix and measure the temperature



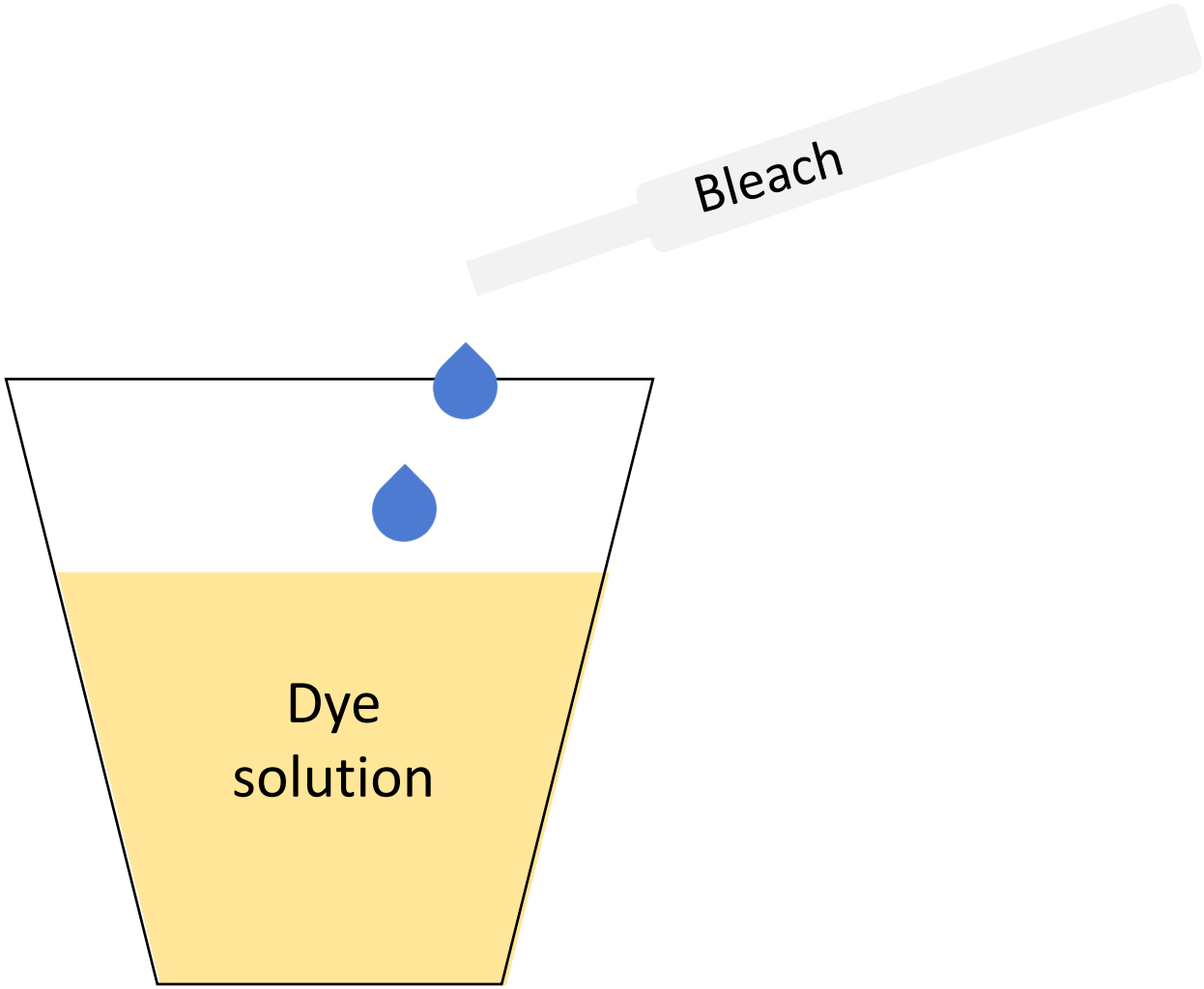
SCIENCE BUDDIES

Pour 150 mL dye solution in a plastic cup

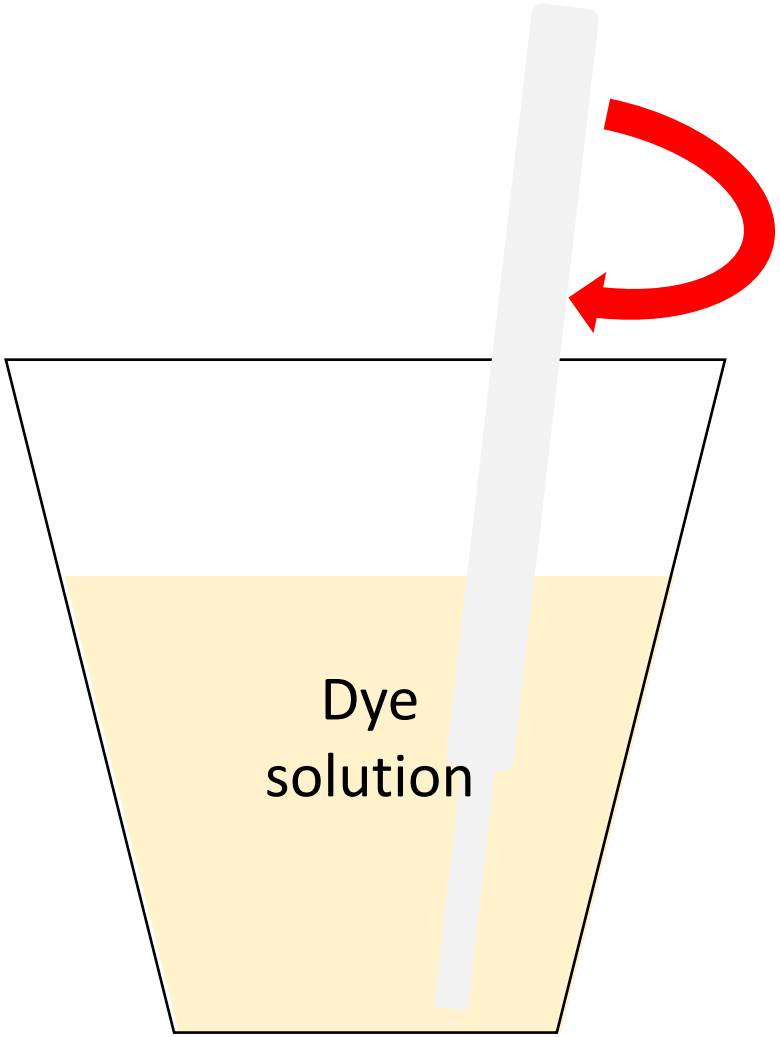


SCIENCE BUDDIES

Add 2 mL bleach and start the stopwatch

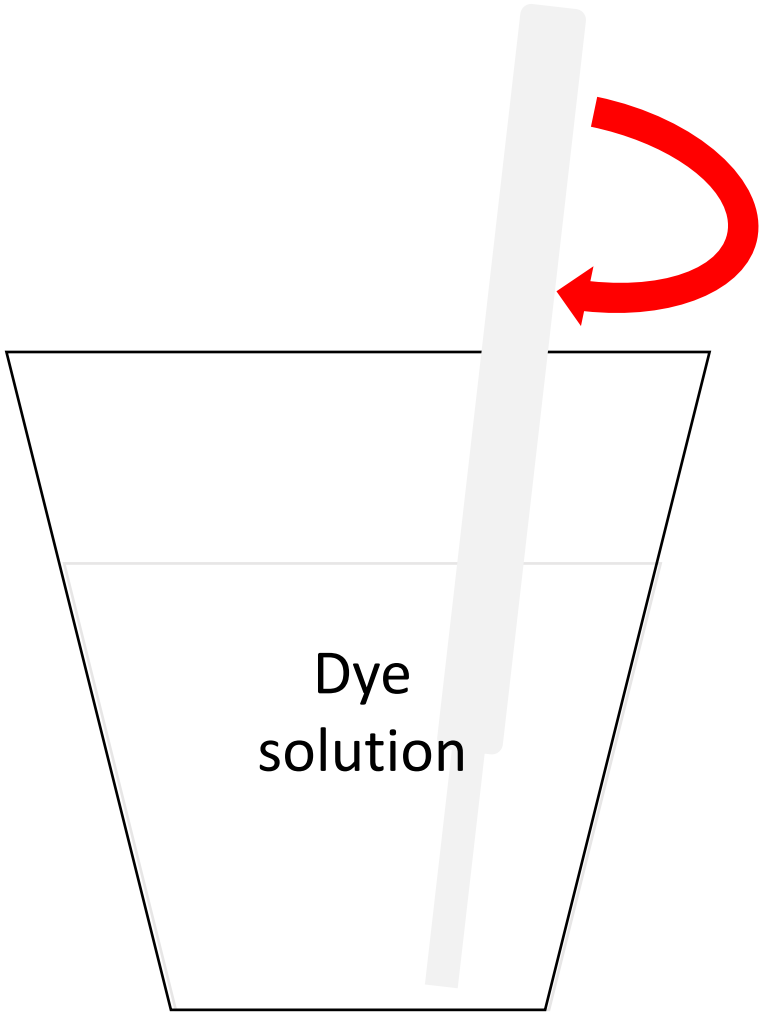


Stir the solution continuously



SCIENCE BUDDIES

Stop the stopwatch once the dye is gone



SCIENCE BUDDIES

Record the reaction time in your data table

Trial	Temperature [°C]	Reaction Time [s]	Reaction Rate [M/s]
1			
2			
3			
Average			

- Repeat the experiment for each temperature two more times, so you have 3 trials in total.
- Calculate the average reaction time for each temperature from all your trials.

SCIENCE BUDDIES

Calculate the reaction rate

$$\text{Reaction rate} = -\frac{\text{Change in dye concentration [M]}}{\text{Change in time [s]}}$$

Change in dye conc. [M] = Final dye conc. [M] – Initial dye conc. [M]

Final conc. of dye [M] = 0 M
Initial dye conc. [M] = 0.0005 M

Change in time [s] = Final time [s] – Initial time [s]

Final time [s] = Time at end of reaction [s]
Initial time [s] = 0 seconds

SCIENCE BUDDIES